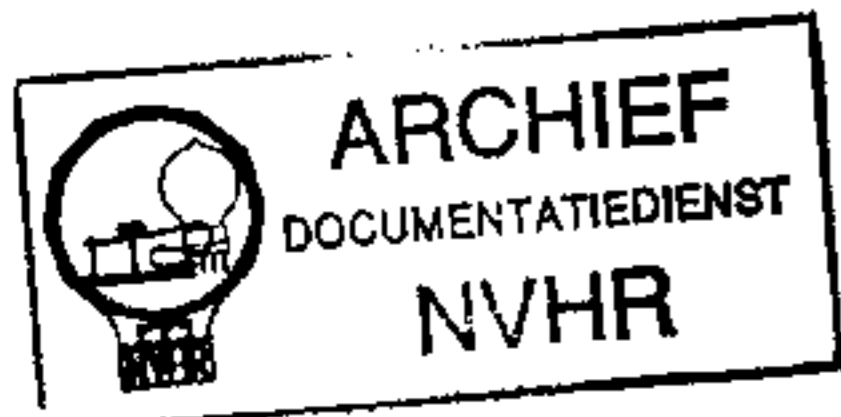


Ned. Ver. v. Historie v/d Radio



BURGOYNE AWTU

AND AWTUG RADIO-GRAM

A SHORT-WAVE range of 19-51 metres is covered by the Burgoyne AWTU "T.R.F. A.C./D.C. Receiver." It is a 3-valve (plus rectifier) A.C./D.C. 3-band model suitable for mains of 200-250 V and having provision for a gramophone pick-up and extension speaker. A Droitwich rejector can be brought into circuit by means of an alternative aerial socket.

A similar chassis is fitted in the AWTUG radio-gramophone, but this *Service Sheet* was prepared on a table model receiver.

CIRCUIT DESCRIPTION

Two alternative aerial input connections, **A1** via Droitwich rejector **L1**, **C21**, series choke **L2** and condenser **C2**, and **A2** via series condenser **C1**, to coupling condensers and coils **C3** (S.W.), **C4**, **L4** (M.W.), **L6**, **L7** (L.W.). Single tuned circuits comprising **L3**, **C24** (S.W.), **L5**, **C24** (M.W.) and **L8**, **C24** (L.W.) precede variable- μ pentode R.F. amplifier (**V1**, Tungfram metallised **VP13B**). Gain control by variable cathode resistance **R4**.

Tuned-secondary transformer couplings by **L9**, **L11**, **C29** (S.W.), **L13**, **L14**, **C29** (M.W.), and **L16**, **L17**, **C29** (L.W.) between **V1** and R.F. pentode detector (**V2**, Tungfram metallised **SP13B**) which operates on grid leak system with **C10** and **R6**. Reaction is applied from anode

by coils **L10** (S.W.) and **L15** (M.W. and L.W.) and controlled by variable condenser **C25**. Provision for connection of gramophone pick-up in C.G. circuit by isolating transformer **T1** and switch **S25**. R.F. filtering in anode circuit by choke **L18** and by-pass condensers **C8** (M.W. and L.W.) and **C13** (S.W., M.W., and L.W.).

Resistance-capacity coupling by **R7**, **C14**, **R10** between detector and pentode output valve (**V3**, Tungfram **PP36**). Fixed tone correction by anode condenser **C16**. Provision for connection of high-resistance external speaker in anode circuit; plug-operated switch **S26** breaks **T2** primary circuit.

When the receiver is used with A.C. mains, H.T. current is supplied by half-wave rectifying valve (**V4**, Tungfram **V30**). Smoothing by iron-cored choke **L22** and by dry electrolytic condensers, **C17**, **C18**. Speaker field coil **L21** is shunted across main H.T. supply.

Valve heaters are connected in series together with scale lamps and tapped ballast resistance **R12**. Chokes **L23**, **L24** and condenser **C20** form a filter for the suppression of mains-borne interference.

DISMANTLING THE SET

Removing Chassis.—To remove the chassis from the cabinet, remove the four control knobs (recessed grub screws) and the nuts and washers from the four bolts

holding the chassis to the fillets on the sides of the cabinet. Now free the speaker leads from the cleat holding them to the shelf and unsolder them. The chassis can now be withdrawn.

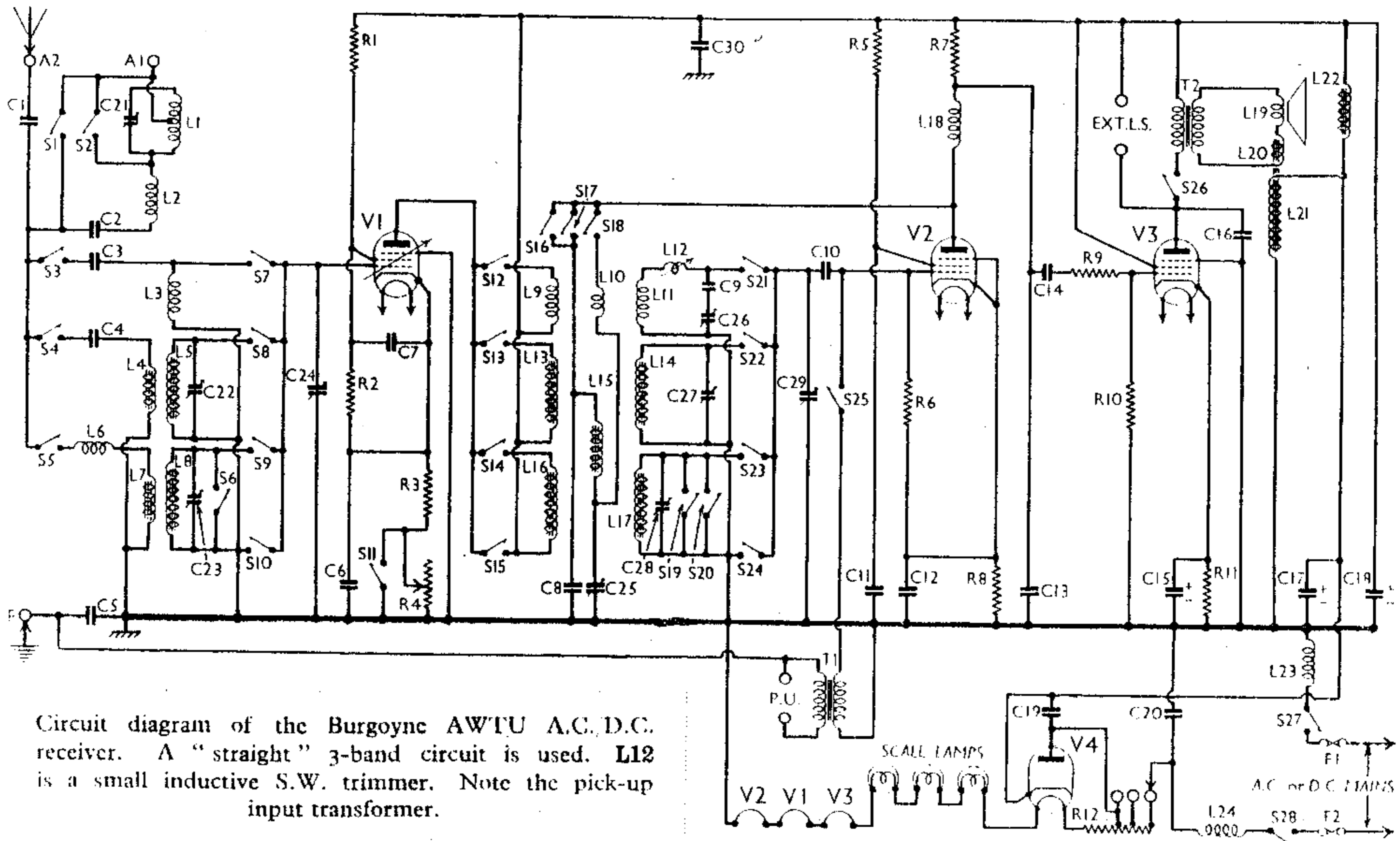
When replacing, connect the leads as follows, numbering the tags from bottom to top: 1, black, and white to speaker frame; 2, white; 3 and 4, blank; 5, red; 6, yellow. Also note that the knob with the white dot goes on the spindle of the wave-change switch.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, remove the nuts from the four bolts holding it to the sub-baffle, and when replacing, see that the transformer is on the left, and with the lock-nut fix the tag for the earthing lead on the bottom left-hand screw.

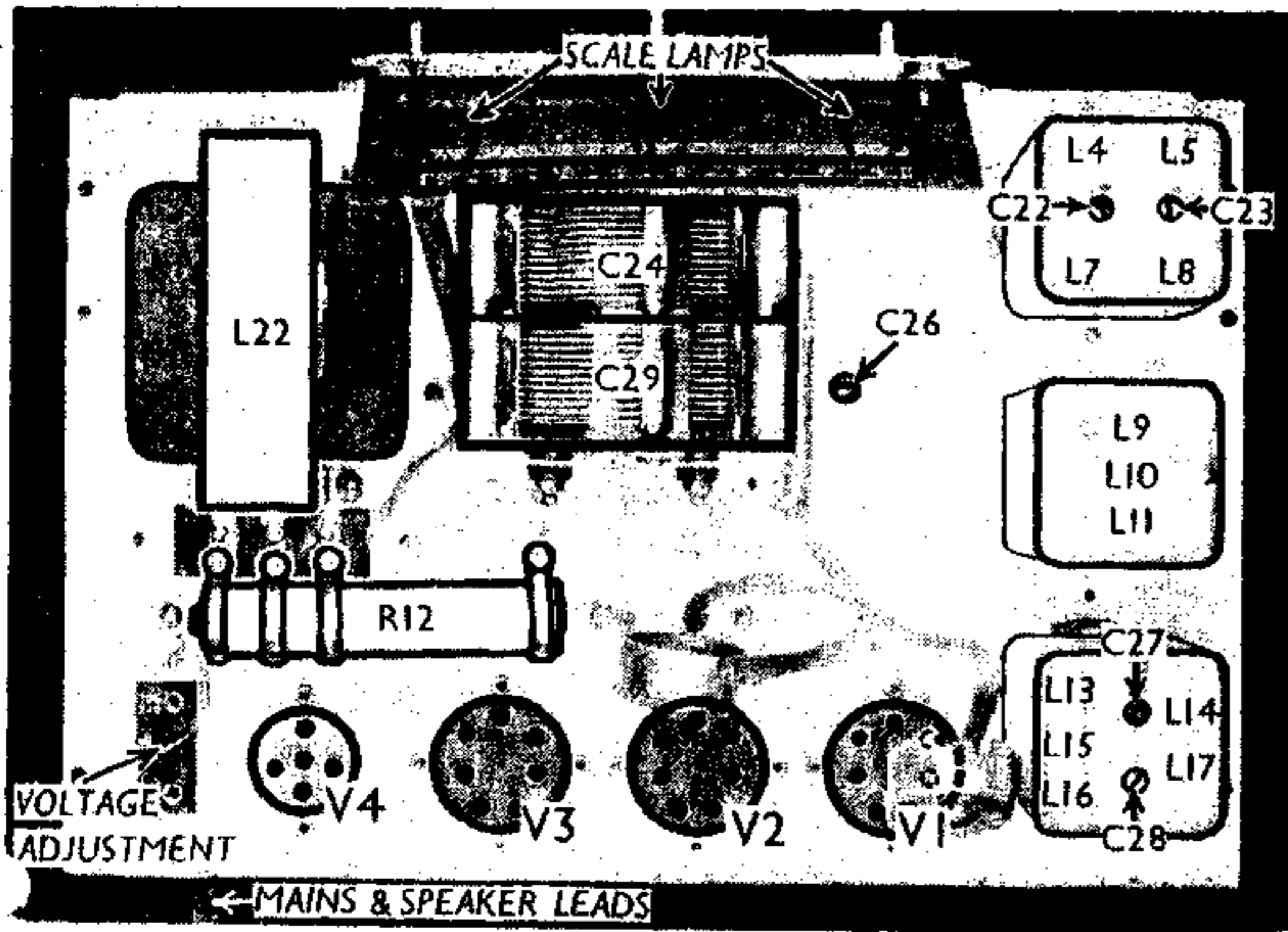
COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 S.G. H.T. potential divider	20,000
R2		500,000
R3	V1 fixed G.B. resistance	200
R4	V1 gain control	100,000
R5	V2 S.G. H.T. feed	100,000
R6	V2 grid leak	1,000,000
R7	V2 anode load	50,000
R8	V2 G.B. resistance (gram.)	200
R9	V3 C.G. R.F. stopper	50,000
R10	V3 C.G. resistance	250,000
R11	V3 G.B. resistance	1,40
R12	Heater circuit ballast	700*

* 500 + 100 + 100 Ω .



Circuit diagram of the Burgoyne AWTU A.C./D.C. receiver. A "straight" 3-band circuit is used. **L12** is a small inductive S.W. trimmer. Note the pick-up input transformer.



Plan view of the chassis. R12 is the tapped heater ballast resistance. C26 is adjustable through a hole in the chassis deck.

Switch	L.W.	M.W.	S.W.	Gram.
S1	O	O	O	O
S2	O	O	O	O
S3	O	O	O	O
S4	O	O	O	O
S5	O	O	O	O
S6	O	O	O	O
S7	O	O	O	O
S8	O	O	O	O
S9	O	O	O	O
S10	O	O	O	O
S11	O	O	O	O
S12	O	O	O	O
S13	O	O	O	O
S14	O	O	O	O
S15	O	O	O	O
S16	O	O	O	O
S17	O	O	O	O
S18	O	O	O	O
S19	O	O	O	O
S20	O	O	O	O
S21	O	O	O	O
S22	O	O	O	O
S23	O	O	O	O
S24	O	O	O	O
S25	O	O	O	O

CONDENSERS		Values (μF)
C1	Aerial series condensers	0.0002
C2		0.0001
C3		0.0001
C4		0.0002
C5		0.1
C6		0.1
C7		0.1
C8		0.0005
C9		0.00005
C10		0.0001
C11		0.1
C12		0.1
C13		0.0002
C14		0.1
C15*		25.0
C16		0.01
C17*	20.0	
C18*	20.0	
C19	0.1	
C20	0.1	
C21†	Droitwich rejector tuning	...
C22†	Aerial circuit M.W. trimmer	...
C23†	Aerial circuit L.W. trimmer	...
C24†	Aerial circuit tuning	0.0005
C25†	Reaction control	0.0005
C26†	H.F. trans. S.W. trimmer	...
C27†	H.F. trans. M.W. trimmer	...
C28†	H.F. trans. L.W. trimmer	...
C29†	H.F. trans. tuning	0.0005
C30	H.T. supply R.F. by-pass	0.1

* Electrolytic. † Variable. ‡ Pre-set.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V. using the 220-230 V tapping on the mains resistance. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input. Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

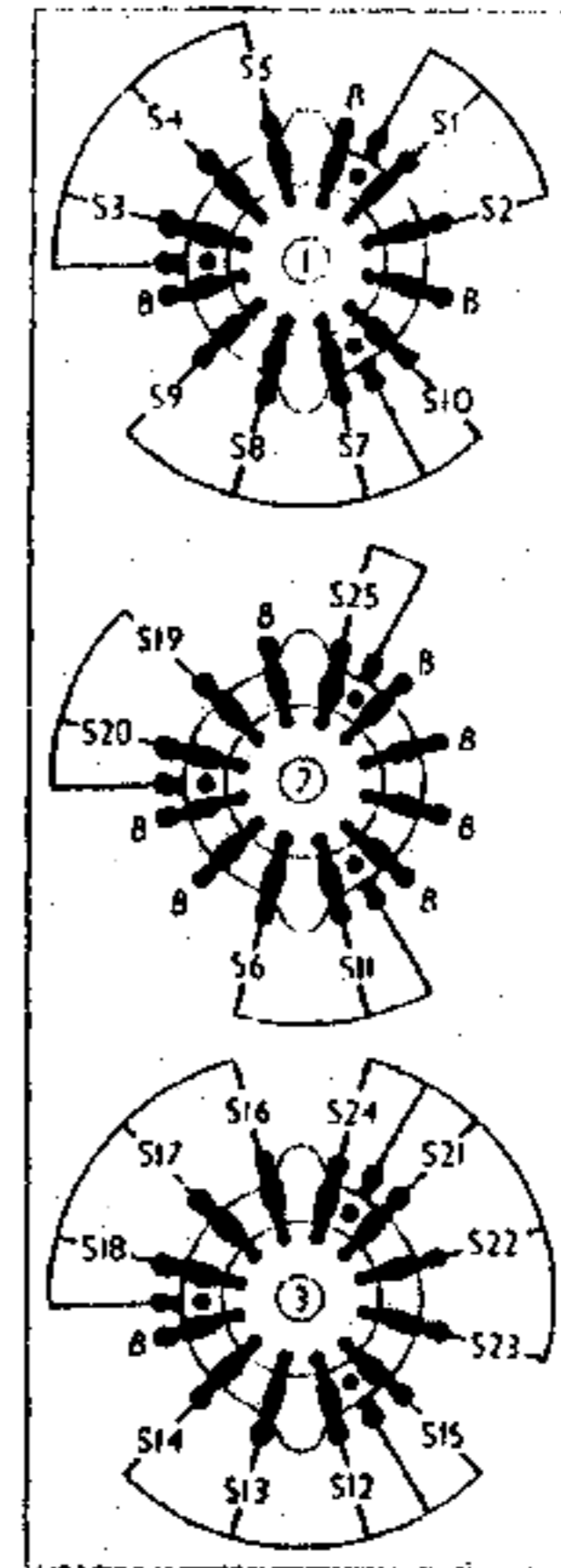
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP13B	180	5.5	130	1.8
V2 SP13B	95	1.4	65	0.5
V3 PP36	155	42.0	180	6.2
V4 V30†

† Cathode to chassis 200 V, D.C.

GENERAL NOTES

Switches.—S1-S25 are the wave-change and pick-up switches, in three ganged rotary units, shown in the under-chassis view. The arrows indicate the

directions in which the units are viewed in the detailed diagrams on this page.



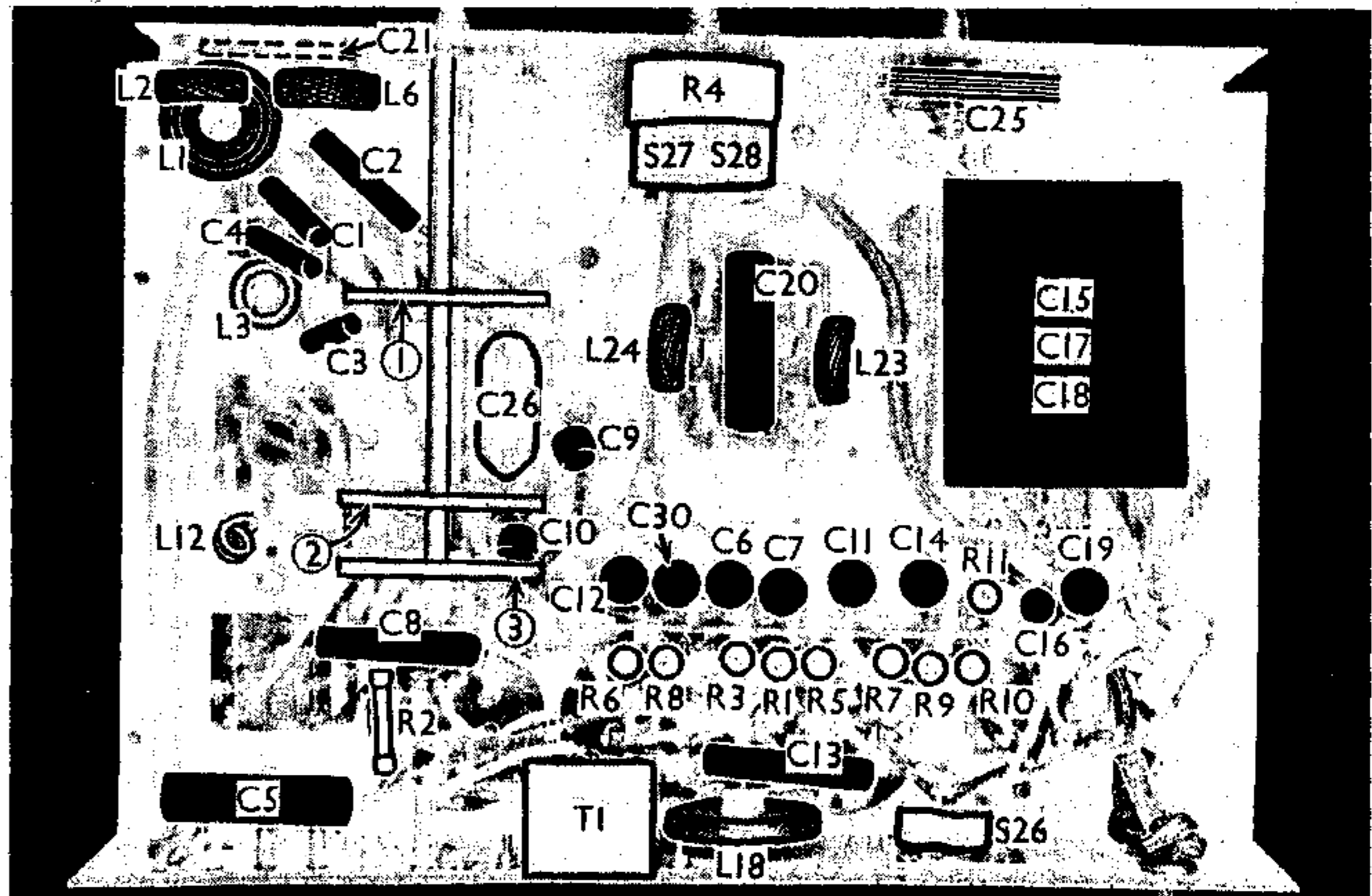
The table above gives the switch positions for the various control settings, starting from the fully anti-clockwise position. O indicates open, and C, closed.

S26 is the internal speaker switch, at the rear of the chassis, which opens when the external speaker plug is inserted and rotated anti-clockwise.

Continued overleaf

Switch diagrams, as seen from the rear of the underside of the chassis.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Droitwich rejector coil	37.0
L2	Aerial series choke	8.6
L3	Aerial S.W. tuning coil	Very low
L4	Aerial M.W. coupling coil	0.35
L5	Aerial M.W. tuning coil	3.3
L6	Aerial L.W. choke	20.0
L7	Aerial L.W. coupling coil	3.0
L8	Aerial L.W. tuning coil	12.0
L9	H.F. trans. S.W. pri.	0.2
L10	S.W. reaction coil	0.2
L11	H.F. trans. S.W. sec.	0.15
L12	S.W. inductance trimmer	Very low
L13	H.F. trans. M.W. pri.	1.2
L14	H.F. trans. M.W. sec.	3.8
L15	M.W. and L.W. reaction coil	1.5
L16	H.F. trans. L.W. pri.	2.8
L17	H.F. trans. L.W. sec.	12.5
L18	V2 anode R.F. choke	210.0
L19	Speaker speech coil	2.0
L20	Hum neutralising coil	0.15
L21	Speaker field coil	6,500.0
L22	H.T. smoothing choke	290.0
L23	Mains circuit filter chokes	0.9
L24		0.9
T1	Gram. pick-up trans. Pri.	1,750.0
	Sec.	3,750.0
T2	Speaker input trans. Pri.	580.0
	Sec.	0.25
S1-S4	Waveband switches	
S25	Gram. pick-up switch	
S26	Int. speaker switch	
S27-S28	Mains switches, ganged	
F1, F2	Mains circuit fuses	



Under-chassis view. C21 is adjustable through a hole in the front of the chassis. Note the inductive trimmer L12.